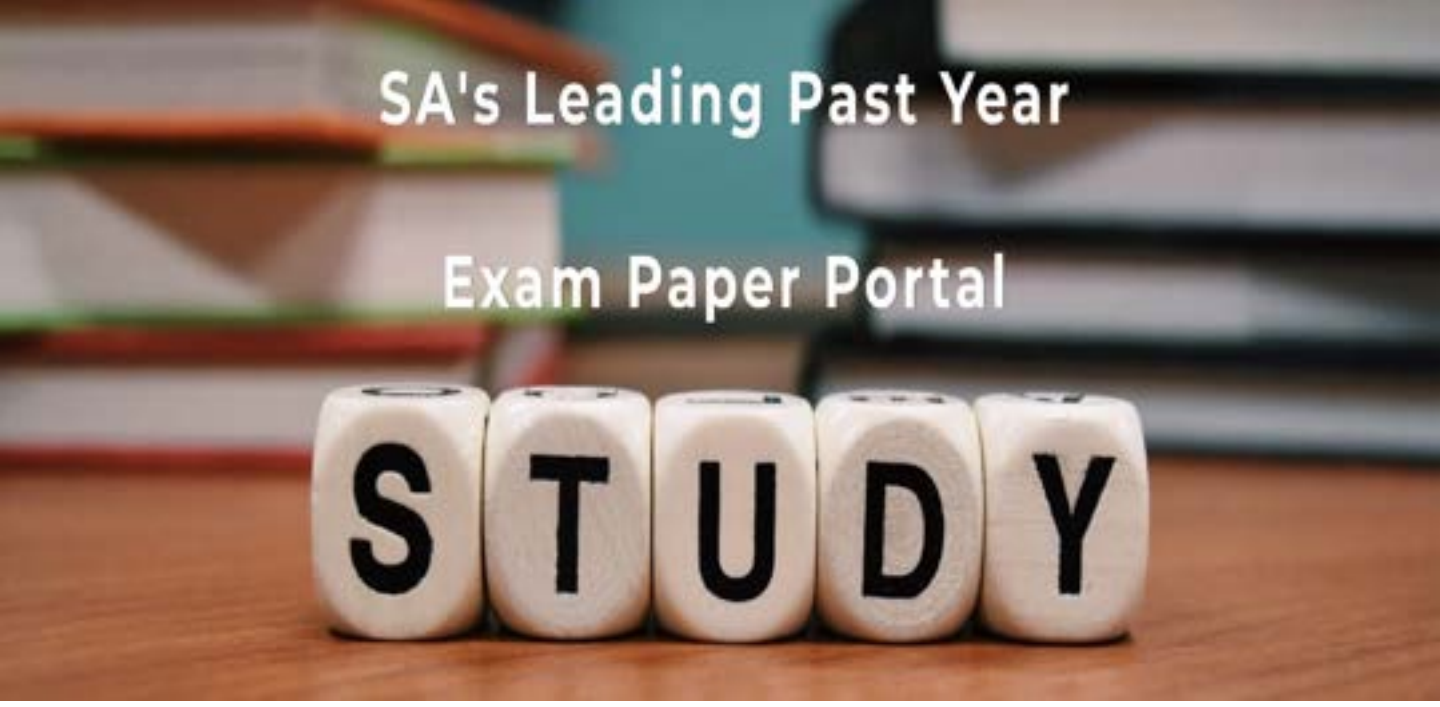

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CAPRICORN SOUTH DISTRICT

MATHEMATICAL LITERACY

GRADE 12

PRE JUNE EXAMINATION

2023

DATE: 19 May 2023

DURATION: 2 Hours

MARKS: 90

This question paper consists of 10 pages including the cover page and ANNEXURE A.

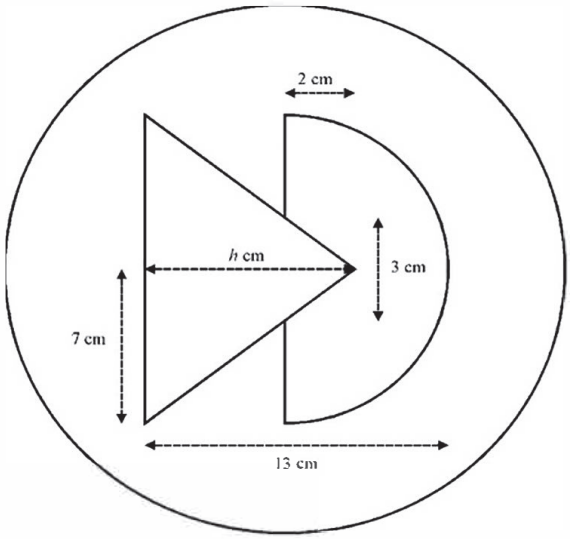
INSTRUCTIONS AND INFORMATION:

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Number the questions correctly according to the numbering system used in this question paper.
3. Start each question on a NEW page.
4. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
5. Show ALL calculations clearly.
6. Round ALL the final answers appropriately according to the context, unless stated otherwise.
7. Indicate units of measurement, where applicable.
8. Maps and diagrams are NOT necessary drawn to scale, unless stated otherwise.
9. Write neatly and legibly.

QUESTION 1

1.1

Smorgasbord Shipping has hired you to help design a logo for them. They plan to paint this logo on all of their large packing crates. The logo is made up of an isosceles triangle and a semi-circle inside a larger circle.



The radius of the semi-circle is 7 cm and the radius of the large circle is 10 cm. The triangle overlaps the semi-circle by 2 cm as shown.

The semi-circle is to be painted red. The triangle is to be painted blue. The background (the large circle) is to be painted white.

The area of a circle is: $A = \pi r^2$

The area of a triangle is: $A = \frac{1}{2}(\text{base} \leftarrow \text{height})$

Adapted from Study Guide.

Use the information above to answer the questions that follow.

1.1.1 Calculate the value of h, the height of the triangle. (3)

1.1.2 What is the surface area of the triangle? (That is, the area to be painted blue.) (3)

1.1.3 Calculate the area to be painted red (to the nearest cm^2). (4)

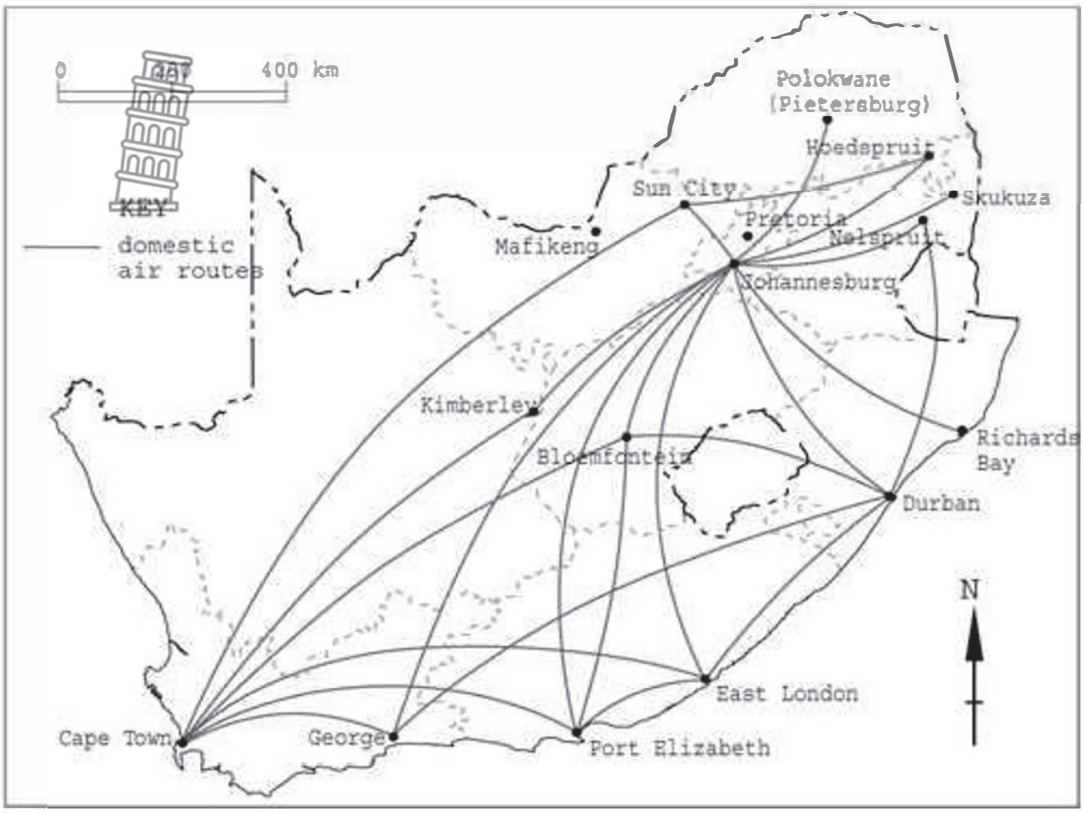
1.1.4 Calculate the area to be painted white (to the nearest cm^2). (4)

1.1.5 If 5 ml of paint covers 1 cm^2 of surface area, how many millilitres of white paint will be required for one logo? (2)

1.1.6 If a two-litre tin of white paint is purchased, what percentage of the paint will be used to paint one logo? (2)

1.2

You intend travelling our country by South African Airways (SAA). The map below shows the domestic air routes for SAA.



Adapted from Study Guide

Use the information above to answer the questions that follow.

1.2.1 Write down the name of the city where most of the domestic flight routes leave and return? (2)

1.2.2 Which of the following flights is/are possible? (2)

a) Cape Town to Sun City, direct.

b) Cape Town to Richards Bay, direct.

c) Cape Town to Durban, direct

1.2.3 What is the distance in cm on the map between Cape Town and Johannesburg (straight between the points, not along the flight routes)? (2)

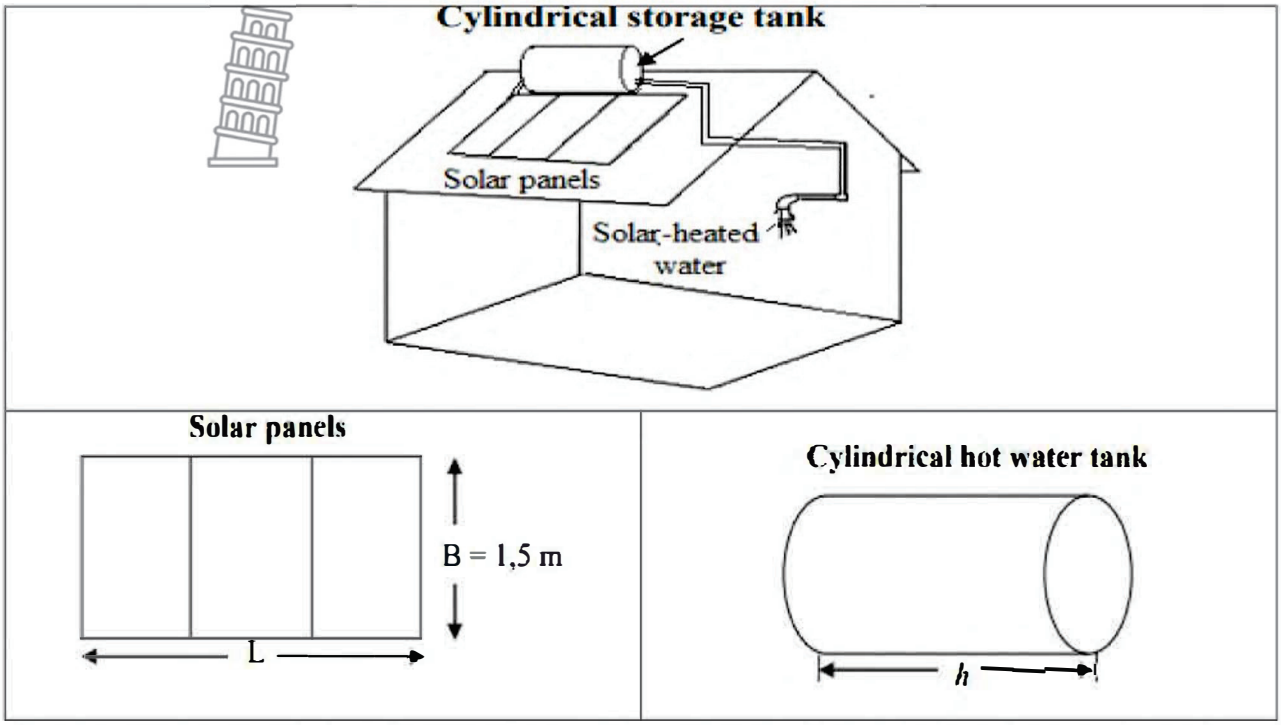
1.2.4 Using the conversion key provided, what distance in km does each cm the map correspond to? (2)

1.2.5 Describe two possible ways to get from Cape Town to Johannesburg b making only one stop. (4)

[30]

QUESTION 2

To reduce his electricity bill, Elvis Louw decides to install a solar geyser of the roof of his house. The solar geyser consists of rectangular solar panels and cylindrical storage tank as shown in the diagrams.



The solar panels use sunlight to heat water stored in the cylindrical tank. The heated water can then be used in the house. There are altogether six people in Elvis Louw's household.

You may use the following formulae:

Area of a rectangle = Length × Breadth
Volume of a cylinder = $\pi \times r^2 \times h$, where r = radius, h = height and $\pi = 3{,}142$

Source: Adapted from www.sars.gov.za

Use the information above to answer the questions that follow.

2.1 Elvis Louw was told that he needed solar panels with an area of 2 m^2 for the first two members in his household and thereafter an area of 0,7 m^2 for each additional member.

a) Determine the total length (L) of the solar panels needed by Elvis Louw if the breadth (B) is 1,5 m. (6)

b) The hot water tank on the roof has a volume of 150 l and a height (h) of 1,2 m. Calculate (to the nearest cm) the length of the radius of the tank if 1 l = 1 000 . (6)

2.2 Jake's Electrician normally charge R24 500 to supply and install the solar geyser. They offer a discount of 35% on the type of geyser Elvis Louw ordered. (9)

He currently pays an average of R1 250 per month for electricity he calculated that 45% of his electricity usage is for water heating.

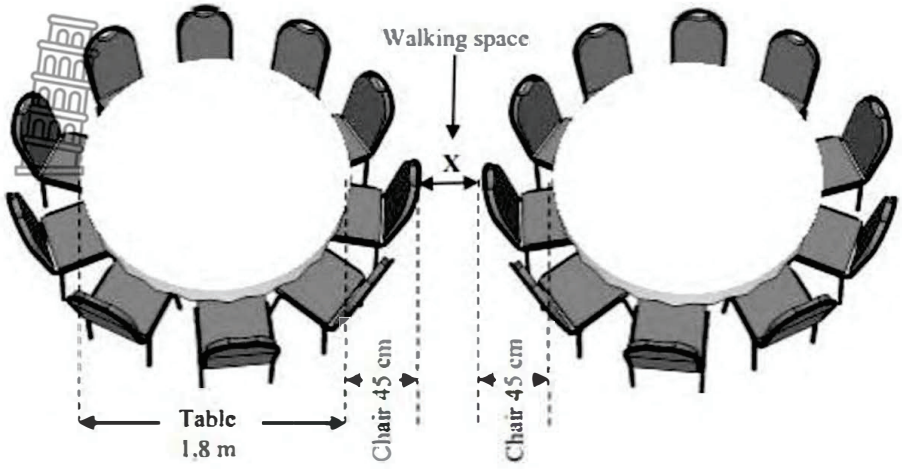
He states that if he can save 45% on his monthly electricity bill, he will be able to recover the cost of the solar geyser within two years.

Verify whether Elvis Louw's statement is valid. Justify your answer by showing ALL relevant calculations.

[21]

QUESTION 3

Elvis Louw has organized a hall for Mother's day celebration. He invited 150 guests and 2 motivational speakers.



NOTE:
Dimensions of the hall: 23 m × 18 m.
The venue includes round tables with a diameter of 1,8 m that can each seat 10 persons.

Use the information above to answer the questions that follow.

3.1 Define the term "Diameter" according to the given context. (2)

3.2 Elvis Louw calculated that they need 9 m^2 per round table. He claims that 30 of the round tables will fit into the space. (7)

Verify Elvis Louw's claim that 30 tables will fit into the space.

You may use the following formula: **Area of a rectangle = length × breadth**

3.3 Calculate the amount of walking space between two tables at the point where they are the closest, if the space allowed per chair is 45 cm. (5)

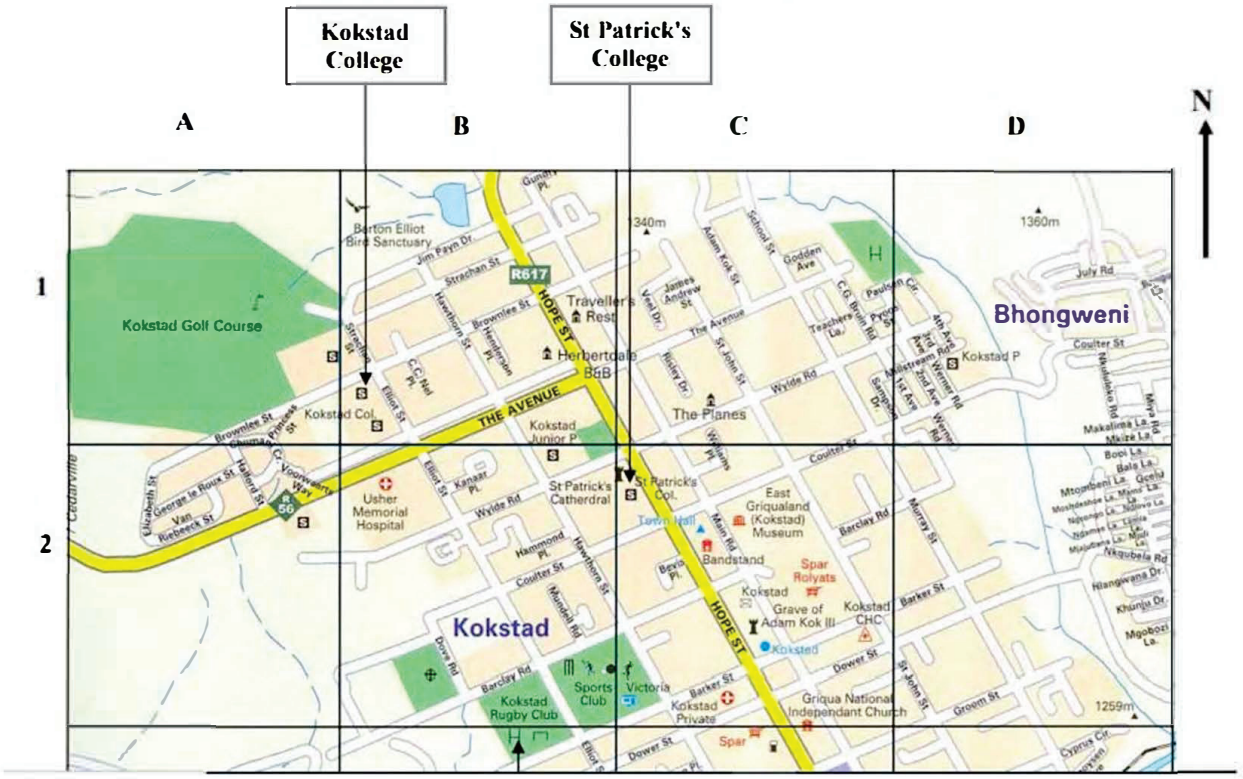
[14]

QUESTION 4

4.1

Rakesh Naidoo used a map to assist out-of-town visitors to find their way to the tournament venue. A copy of the map is given on below.

MAP OF PART OF KOKSTAD IN THE EASTERN CAPE



Use the information above to answer the questions that follow.

4.1.1 Write down the grid reference of St Patrick's College. (2)

4.1.2 Describe the shortest route from Kokstad college, whose entrance is in Brownlee Street, to Kokstad Rugby Club, whose entrance is in Barclay Road. (2)

4.1.3 In which general direction does Hope Street run? (2)

4.1.4 The distance on the map (as the crow flies) between the entrance to Kokstad Rugby Club and St Patrick's College in Hope Street is 5 cm. The scale on the map is 1: 20 000. Use the scale to calculate the actual distance (as the crow flies) between Kokstad Rugby Club and St Patrick's College in metres. (4)

4.2

Rakesh Naidoo, a South African student, is studying in the United Kingdom (UK). He plans to meet his family in Las Vegas, USA, to attend a boxing match. He will travel by air from London Heathrow Airport (LHR) to McCarran International Airport (LAS).

ANNEXURE A below is showing the seating plan of a Boeing 767-300. An aisle is the passage between rows of seats.

Use the information above to answer the questions that follow.

4.2.1 Calculate the total number of economy Plus seats. (2)

4.2.2 Determine the simplified ratio of the number of Business Class seats to Economy Class seats. (3)

4.2.3 Give a detailed description of the route a passenger in seat 2K will take to walk to a friend in seat 38B if he does not want to disturb other passengers by passing through the rows in the full aircraft. (5)

4.2.4 One of the Business Class passengers ordered coffee. (3)
Determine the probability (as a percentage) that this passenger did NOT have an aisle seat.

4.2.5 Give ONE reason why the price of a First Class aeroplane ticket is much higher than the price of an Economy Class aeroplane ticket. (2)

[25]

TOTAL MARKS: 90